## Space Weather Forecast

Issued on Saturday, 04 June 2022 at 13:13 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of G1-G2/Minor to Moderate Storm intervals late Day 2 or Day 3 (5th-6th) from possible CME arrival(s).**

**Analysis of Space Weather Activity over past 24 hours**
**Solar Activity:** Solar activity has been Very Low, with no significant flares during the period. There are four numbered sunspot regions on the disc, and two further very small new and unnumbered regions. A region in the southwest was showing development earlier, but has now stabilised. However, despite the development, significant flaring has not yet been observed. All other regions are small and simple. One Coronal Mass Ejection (CME) has been observed in the northeast quadrant. It is too early to fully assess this, but it is likely to be too northward directed to have a significant Earth directed component.

**Solar Wind / Geomagnetic Activity:** The solar wind has been at background levels through the period. Wind speed has varied between 280-300 km/s. The total interplanetary magnetic field strength has been weak, with the north-south component varying weakly, but largely in the negative direction. Geomagnetic activity was Quiet (Kp 0-2).

**Energetic Particles / Solar Radiation:** The count rate of solar energetic particles (high energy protons) remained at background with no solar radiation storms observed.

**Four-Day Space Weather Forecast Summary**
**Solar Activity:** Solar activity is expected to be Low to Very Low, with a chance of Common-class flares and only a very slight chance of Moderate-class flares.

**Solar Wind / Geomagnetic Activity:** There are two potentially Earth-directed CMEs, although both are low confidence. Both are due to eruptions of 'filaments', or lines of plasma held above the Sun's surface by its magnetic field. These are expected to pass Earth late on day 2 or day 3 (5th or 6th) with a chance of combining into a single arrival. Aside from the CMEs, no other solar wind enhancements are indicated, with mainly background winds expected. Geomagnetic activity is forecast to be predominately Quiet, but increasing to Unsettled to Active late day 2 and day 3 (5th and 6th) should any CME arrivals occur. These will also give a chance of isolated G1-G2 Minor to Moderate storms.

**Energetic Particles / Solar Radiation:** The count rate of solar energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 20 | 30 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 5 | 5 | 5 | 5 |
| Very Active | R3 to R5 X | No | 1 | 1 | 1 | 1 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 1 | 1 | 1 | 1 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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